# MARINE REVIEW.

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## Engines of the New Torpedo Boats.

In the MARINE REVIEW, issue of Oct. 25, there was printed a short description of the new United States torpedo boats 3, 4 and 5, which will be soon advertised by the navy department. Through the kindness of the officers of the bureau of steam engineering, we are enabled to present on this page drawings of the machinery intended for these boats and a description of the same. Regarding the motive power of these boats it may be said in a general way that the design of this machinery is similar to that of the Ericsson, except that the engine is triple expansion instead of quadruple expansion, and that the valves are operated from a countershaft by means of gearing, as is the Cushing. Each engine is in a separate water tight compartment, which is an entirely new departure in torpedo boat practice, the universal practice heretofore being to put both engines alongside of each other in the same compartment, so as to economize space. In these boats, the object of placing each engine in a separate compartment is that the entire machinery may not be disabled by shot passing through the engine department, as would be the case in other torpedo boats. This arrangement of the engines accounts for the engines themselves being triple instead of quadruple expansion. To have fitted the latter would have required more space than could consistently be given up to machinery in the boat. There is little doubt, however, of the engines being quite economical at low speeds, and at full power they will be quite up to the quadruple engine. The boilers will be some type of water tube boilers which meets the approval of the department. No special type has been specified, as the practice has been to allow the contractor a great deal of latitude in such matters.

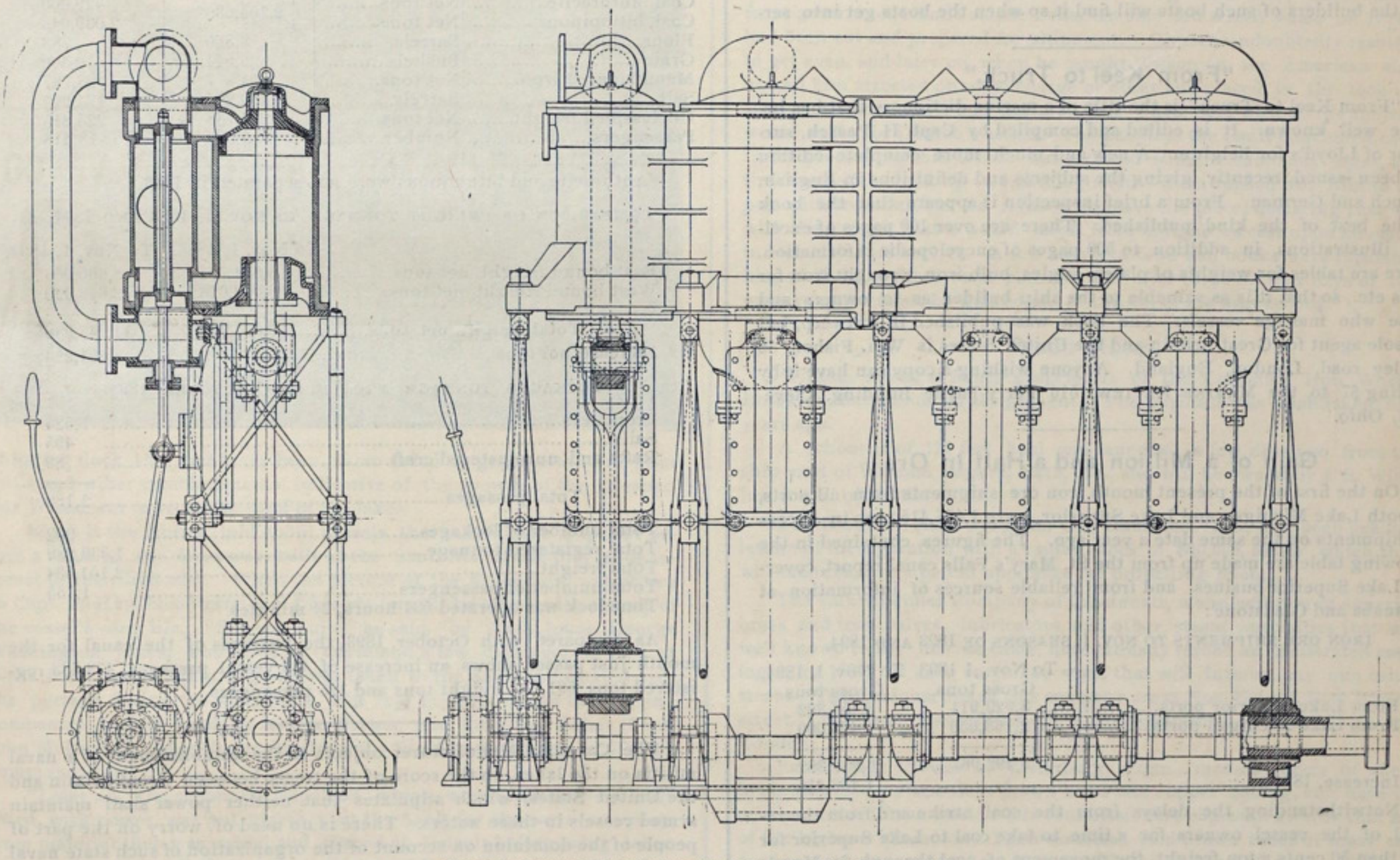
These engines will be of the vertical inverted-cylinder, direct-acting, triple expansion type, each with a high pressure cylinder 12 inches in diameter, an intermediate pressure cylinder 19¼ inches in diameter, and two low pressure cylinders each 22 inches in diameter, the stroke of all pistons being 16 inches. The collective indicative horse power of propelling and circulating-pump engines will be 2,000 when the main engines are making about 412 revolutions per minute. The high pressure cylinder will be aft in the starboard engine and forward in the port engine and the low pressure cylinders will be forward in the starboard engine and aft in the port engine. The main valves will be worked by means of cranks or eccentrics on a shaft parallel to the main engine shaft and geared to that shaft. All the main valves will be piston valves, there being one for each high pressure, two for each intermediate pressure, and two for each low pressure cylinder.

Each main piston will have one piston rod, with a crosshead working on a slipper guide. The framing of the engines will consist of vertical forged steel columns well stayed by diagonal braces. The engine bedplates will be of plate steel, supported on wrought steel keelson plates built in the vessel. The crank shafts will be made in one section and will be hollow. The shafts, piston rods, connecting rods and working parts generally, will be forged of mild, open-hearth steel. The piston rods, connecting rods, and valve rods will be oil tempered.

There will be two condensers made entirely of composition and sheet brass. Each will have a cooling surface of about 800 square feet, measured on the outside of the tubes, the water passing through the tubes. For each propelling engine there will be one single-acting air pump driven from the main engine shaft. The circulating pumps will be of the centrifugal type, one for each condenser. The propellers will be right and left, of maganese bronze or approved equivalent metal.

Steam will be furnished by two water tube boilers constructed for a working pressure of 250 pounds per square inch. Each boiler will be placed in a water tight compartment, one being forward of the engines and the other aft. The total grate surface will be at least 93.6 square feet, and the total heating surface at least 5,120 square feet. Two smoke pipes will be provided, one for the forward and one for the after boiler.

An auxiliary feed pump is to be placed in each fire room, and they will be duplicates of the main feed pumps. The main feed pumps will connect with the main feed pipes, and each set will have a capacity sufficient to supply the amount of water necessary for the boilers when steaming at full power under forced draft. There will be one blower for each fire room and it will discharge into its fire room. Bulkheads and air



ENGINES OF THE LATEST UNITED STATES TORPEDO BOATS.

locks will be fitted so as to make the fire rooms air tight. In addition there will be two evaporators and one distiller, and such other auxiliary or supplementary machinery, tools, instruments, or apparatus as are usually provided for such boats. The weight of all the machinery and boilers, including auxiliaries and water in the boilers, condensers, and pipes, but not including stores, spare parts, heaters, steering gear, and capstan, must not exceed 60 tons.

## In General.

Tonnage of the whaleback steamer City of Everett, launched at Everett, Wash., a few days ago, is 2,556.37 gross and 1,934.75 net. Her official number is 127,055.

The international code of marine signals for the use of all nations forms a volume of 400 pages that is issued by the United States hydrographic office. It was revised by the branch of the government service during the present year. A charge of $3 is made for it, and it can be had from the MARINE REVIEW.

Engineer-in-Chief Melville of the United States navy is very decided in his views upon the unsuitability of aluminum for the manufacture of parts of steam machinery. "Aluminum is a failure," he says, "for steam machinery where great atrength and exposure to a certain amount of heat are required, as it does not stand heat and has not the strength we demand. It may combine lightness with strength for light uses, but at this stage of its development it can not be relied upon for the enormous strain put upon steam engine machinery in these times." In referring to the construction of aluminum torpedo boats, the chief adds: "Its a mistake and the builders of such boats will find it so when the boats get into service."

## "From Keel to Truck."

"From Keel to Truck" is the title of a marine dictionary that has become well known. It is edited and compiled by Capt. H. Paasch, surveyor of Lloyd's for Belgium. A new and much more complete edition has been issued, recently, giving the subjects and definitions in English, French and German. From a brief inspection it appears that the book is the best of the kind published. There are over 100 pages of excellent illustrations, in addition to 500 pages of encyclopedic information. There are tables for weights of plates, angles, bulb iron, wrought iron for keels etc., so that it is as valuable to the ship builder as to owners and those who manage vessels. The book was published in Antwerp, but the sole agent for Great Britain and the United States is Wm. Fisher, 56 Hanley road, London, England. Anyone wishing a copy can have it by sending $7 to the MARINE REVIEW, 516 Perry-Payne Building, Cleveland, Ohio.

## Gain of a Million and a Half in Ore.

On the first of the present month iron ore shipments from all ports, on both Lake Michigan and Lake Superior, were 1,458,415 tons in excess of shipments on the same date a year ago. The figures contained in the following table are made up from the St. Mary's Falls canal report, covering Lake Superior busines, and from reliable sources of information at Escanaba and Gladstone:

IRON ORE SHIPMENTS TO NOV. 1, SEASONS OF 1893 AND 1894.

| | To Nov. ,1 1893. Gross tons. | To Nov. 1, 1894. Gross tons. |
|---|---|---|
| From Lake Superior ports | 3,929,911 | 5,456,382 |
| From Lake Michigan ports | 2,163,056 | 1,495,000 |
| | 5,492,967 | 6,951,382 |
| Increase, 1894 | | 1,458,415 |

Notwithstanding the delays from the coal strike and from the refusal of the vessel owners for a time to take coal to Lake Superior for less than 50 cents a ton freight, the movement of coal through St. Mary's Falls canal, hard and soft, for the season to Nov. 1 is now only 236,589 net tons short of what it was at this time a year ago, as shown by the following table:

COAL SHIPMENTS THROUGH ST. MARY'S FALLS CANAL BY MONTHS, TO NOV. 1, SEASONS OF 1894 AND 1893.—NET TONS.

| Months. | 1894. Bituminous. | 1894. Anthracite. | 1893. Bituminous and Anthracite. |
|---|---|---|---|
| April | 31,052 | 27,398 | ..... |
| May | 16,372 | 52,123 | 390,792 |
| June | 12,300 | 108,220 | 492,397 |
| July | 227,061 | 58,141 | 618,021 |
| August | 648,042 | 42,431 | 420,593 |
| September | 552,930 | 73,750 | 374,339 |
| October | 551,289 | 66,938 | 408,494 |
| Total | 2,039,046 | 429,001 | 2,704,636 |

These figures tend to indicate the enormous movement of freight of all kinds this season to and from Lake Superior. The canal report covering freight of all kinds shows an aggregate movement to Nov. 1 of 11,248,986 net tons, against 9,657,763 tons on the same date a year ago, or a gain of 1,591,223 tons. There is no doubt now of the canal report for the full season showing a wonderful increase over any previous season Even wheat shows an increase in shipments during the month passed as compared with the same month a year ago. Following are the canal statistics in detail:

FREIGHT MOVEMENT TO AND FROM LAKE SUPERIOR UP TO NOV. 1, 1894, COMPARED WITH MOVEMENT TO THE SAME DATE IN 1893.

EAST BOUND, NET TONS.

| ITEMS. | Designation. | To Nov. 1, season of 1893. | To Nov. 1, season of 1894. |
|---|---|---|---|
| Copper | Net tons | 75,531 | 85,979 |
| Corn | Bushels | 2,270,969 | 1,529,948 |
| Building stone | Net tons | 17,999 | 20,295 |
| Flour | Barrels | 5,991,807 | 7,235,568 |
| Iron ore | Net tons | 3,729,506 | 6,111,148 |
| Iron, pig | Net tons | 28,679 | 19,663 |
| Lumber | M. ft. B. M. | 511,686 | 648,643 |
| Silver ore | Net tons | 2,430 | 412 |
| Wheat | Bushels | 37,086,789 | 26,502,088 |
| Unclassified freight | Net tons | 121,696 | 134,021 |
| Passengers | Number | 8,787 | 13,397 |

WEST BOUND, NET TONS.

| | | | |
|---|---|---|---|
| Coal, anthracite | Net tons | 2,704,636* | 429,006 |
| Coal, bituminous | Net tons | | 2,039,046 |
| Flour | Barrels | 3,860 | 783 |
| Grain | Bushels | 26,544 | 10,500 |
| Manufactured iron | Net tons | 54,977 | 28,797 |
| Salt | Barrels | 180,205 | 174,274 |
| Unclassified freight | Net tons | 225,788 | 225,215 |
| Passengers | Number | 9,509 | 13,216 |

*Anthracite and bituminous were not separated in 1893.

COMPARISON OF FREIGHT TONNAGE TO NOV. 1, 1893 AND 1894.

| | To Nov. 1, 1893. | To Nov. 1, 1894. |
|---|---|---|
| East bound freight, net tons | 6,614,735 | 8,600,066 |
| West bound freight, net tons | 3,043,028 | 2,648,920 |
| Total freight, net tons | 9,657,763 | 11,248,986 |
| Increase, net tons | | 1,591,223 |

LOCKAGES, TONNAGE, ETC., DURING OCTOBER, 1894.

| | |
|---|---|
| Propellers | 1,525 |
| Sails | 495 |
| Rafts and unregistered craft | 89 |
| Total passages | 2,189 |
| Total number of lockages | 902 |
| Total registered tonnage | 1,539,289 |
| Total freight | 2,151,534 |
| Total number of passengers | 1,155 |

Time lock was operated 534 hours, 24 minutes.

As compared with October, 1893, the business of the canal for the month just passed shows an increase of 414 vessel passages, 473,533 registered tons, 591,243 freight tons and 125 passengers.

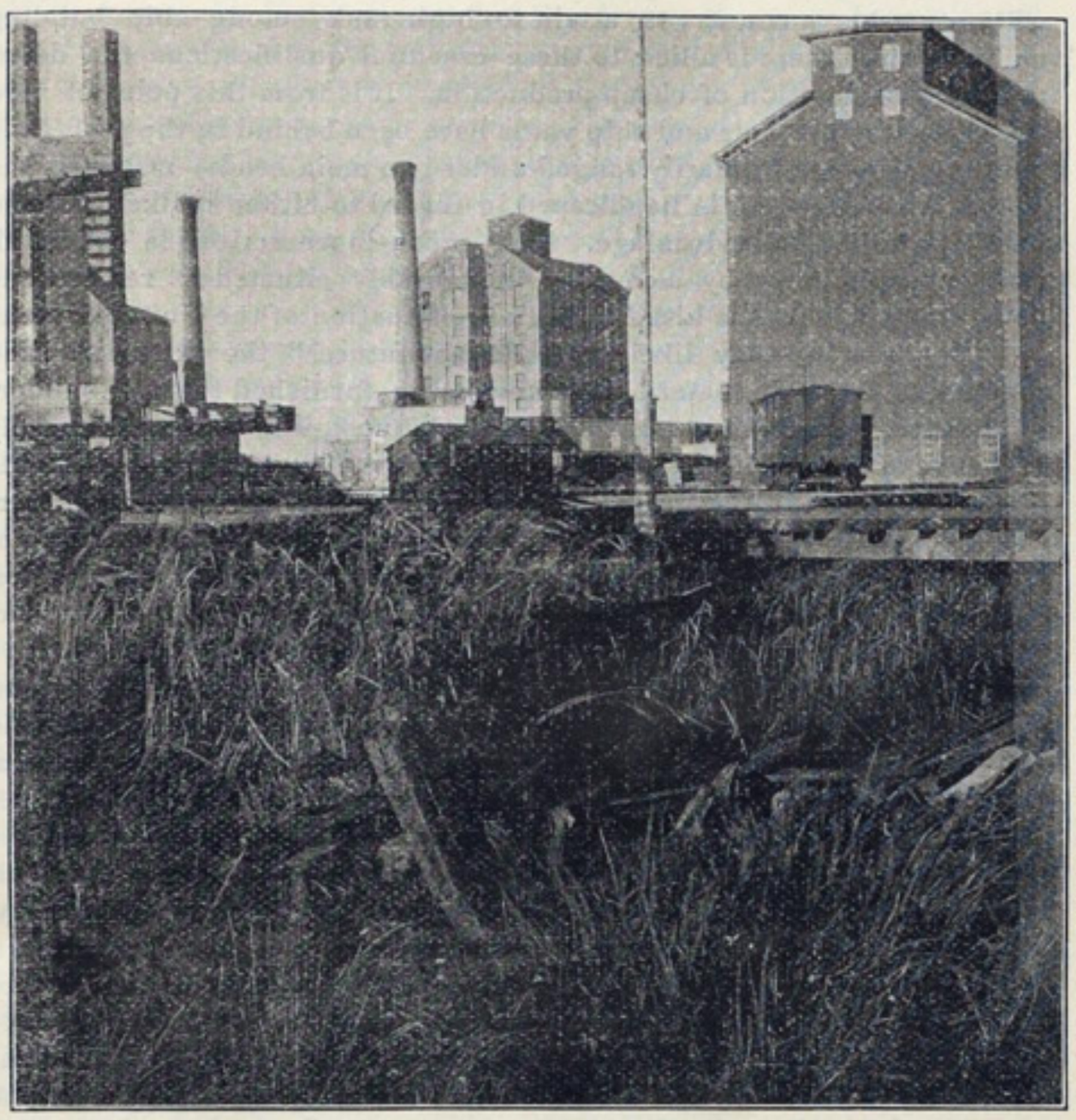
The Canadian Manufacturer objects to the establishment of a naval militia on the lakes, on the score of the treaty between Great Britain and the United States, which stipulates that neither power shall maintain armed vessels in these waters. There is no need of worry on the part of people of the dominion on account of the organization of such state naval reserve bodies as have been established in Chicago and Detroit, but it is probable that objection of this kind will retard the progress of a naval militia on the lakes, as it will prevent advantage being taken of the offer of the government to furnish to the states old war vessels for drill and instruction. The old Michigan, which is the only vessel of war permitted on the lakes, may be used by the state organizations for an occasional cruise of short duration, but she would be of little service if the naval militia plans were extended to the full scope of what might be expected from lake cities.

Charles C. Poe, son of Gen. O. M. Poe, corps of engineers, Detroit, is now in New York acting as vice-president and manager of the Eastern New Jersey Water Company, which controls the water supply of the city of Newark. Mr. Poe graduated from the United States naval academy in 1885. He took an active part, some time ago, in organizing the Detroit division of the Michigan naval militia.

PHOTOGRAPHS of sixteen lake steamers and two color plates will be mailed to any address for 50 cents. MARINE REVIEW, Cleveland, O,

## Early Days on Lake Superior.

Capt. J. W. Walsh of the steamer Grecian brought to Cleveland from West Superior, a few days ago, a photograph that brought out, from a party of vessel owners in the office of Capt. Geo. P. McKay, some interesting reminiscences regarding early navigation on Lake Superior. The picture, which is reproduced here, shows the remains—a few pieces of timber—of the hull of the schooner Algonquin, one of the first vessels taken over the portage at Sault Ste. Marie to Lake Superior. She was 54 feet long, 20 feet beam and 5 feet hold, and her ribs were 5 by 6 inches, spaced 13 inches apart, with planking 1½ inches thick. After a long and eventful career on Lake Superior the Algonquin was sold to fishermen in Old Superior and when no longer fitted for service of any kind, she was, as the sailor would put it, allowed to die a natural death, near an old



shipping dock that has since been surrounded by grain elevators, flour mills and other establishments indicative of the growth of the prosperous Wisconsin town at the head of the lakes.

But it is the stories told about vessels that sailed Lake Superior before a canal of any kind was built at the Sault Ste. Marie that adds interest to their histories. When the picture of the Algonquin was shown to Capt. McKay he entertained a few visitors in the office with a story of the vessel's early life. "She was built," he said, "by 'Wash' Jones (George Washington Jones, who died in Cleveland a few days ago) in 1838 at Black River (now Lorain, O.,) and was taken to the Sault and carried over the portage during the same year. She was built for one of the mining companies having headquarters in Boston, and after my father (Capt. John McKay) moved with our family to the Sault in the spring of 1845 he commanded her."

"Later on, the schooner Napoleon, which which was subsequently fitted with power, was put together at the Sault for the same company, from material that was sawed and shaped at Detroit before being taken to Lake Superior. Father was in charge of both of these vessels when word reached him, one winter, while they were laid up above the site of the present canal, that the Boston Company owning them had failed. We were practically shut out from the world during winter seasons at that time, as there was no railways, telegraph or any other reliable system of communication, and the secret of the Boston company's failure was well kept until the ice began to break up in the spring, when father, who with others held claims against the vessels for services, immediately transferred them to the Canadian side. This action created considerable comment among the residents at the Sault, and they did not understand the meaning of it until, with the first arrival of a boat from below, announcement was made of the failure of the Boston company and creditors sought the boats in an effort to levy attachments on them. The United States marshal from Detroit was there, and all kinds of legal proceedings were talked of before it was finaly proposed to take the boats by force. But preparations had been made for such a move. Through friendly relations with 'Joe' Wilson, who is still living, and who then held a position with the Canadian government that made him lord of the queen's domain in the vicinity of the Sault, the boats were stocked with enough guns and ammunition to start a small-sized war. About sixty men were aboard the vessels, ready to fight, mainly because of father having advanced them money at different times to bring friends out from the old country. 'Joe' Wilson and some of the older settlers on the American side were always on good terms, and he was, of course, willing that they should have, in a case of this kind, the use of such arms and ammunition as were in his charge.

"This was the situation that confronted the United States marshal and Attorney Bates, then one of the famous lawyers of Michigan, when they thought of taking the vessels out of Canada by force. Mr. Bates finally admitted that the two schooners might remain in dominion waters for all time to come, as against any influence other creditors might have to remove them. He proposed that one of them, the Algonquin, be taken to the American side and sold, with the understanding that father and his associates should bid her in for their claims, and then turn over the Napoleon to other creditors. In event of any attempt being made to seize the Algonquin upon her arrival on the United States side of the river, the Napoleon was of sufficient value to cover the claims that were holding both vessels on the Canadian side and the plan was accordingly accepted. Father bought in the Algonquin and kept her until about 1853, when she was sold to parties at the head of the lake."

"When 'Joe' Wilson is spoken of," Capt, McKay continued, "I am always reminded of a difficulty he had in early days with the late P S. Church, father of the present proprietor of the hardware and ship chandlery at the Sault, known by the name of P. M. Church & Co. Church owned a portion of Sugar island and operated a small saw-mill there as far back as forty-five years ago. Wilson charged him with taking timber from government lands on the Canadian side and seized some of it that had been cut and prepared for shipment. Church undoubtedly resolved to get even, and later on, when he caught Wilson on the American side, he had him arrested on some charge or other and placed in the lock-up. Wilson became frantic and declared that Uncle Sam with all his subjects would suffer for Church's action. The people at the Sault concluded early in the proceeding that Wilson was arrested without sufficient cause, and the doors of the lock-up—a small log affair—were opened for him to depart with freedom, but he refused to leave the place, declaring that war with the United States would result from indignities cast upon an officer in Her Majesty's service. A few blankets, food and books were furnished him while he refused to be pacified, and after three or four days of voluntary confinement he walked out of the jail of his own accord."

## Trade Notes.

William Taylor & Sons, proprietors of the Columbia Iron Works, Brooklyn, have made an assignment. The business was established fifty years ago.

A schooner of 172 feet keel was launched a few days ago from the ship yard of William Rogers, Bath, Me., and will be owned by J. S. Winslow & Co., of Portland, Me.

The Hamilton Boat Propeller Co., Hamilton, Ont., has been granted letters of incorporation with a capital stock of $40,000, under which they will manufacture a patent appliance for propelling boats.

The Lukenheimer Company of Cincinnati, manufacturers of superior brass and iron valves, lubricators and other steam specialties that are well known to the marine trade, have already issued an illustrated catalogue for 1895. It is a very neat work that will interest any one using steam. The headquarters of this company are at Nos. 11 to 17 East Eighth street, Cincinnati, but offices are also maintained in New York and London.

Randolph & Clowes of Waterbury, Conn., manufacturers of sheet brass and copper, seamless drawn brass and copper tubing, etc., have recently received from world's fair commissioners copies of awards that are of the highest character. Their seamless cold drawn tubes of brass and copper are pronounced of most extraordinary size and of very admirable workmanship. In the exhibit were many seamless drawn brass and copper tubes from ⅛ inch to 16 inches in diameter and up to 40 feet long. This firm manufactures tubing up to 38 inches diameter.

With the success that has of late attended the practical application of oil for fuel aboard vessels, especially yachts and craft of the smaller class, there is no doubt of a great increase in the use of this kind of fuel, and ship builders, as well as engineers and all others interested in such improvements, will profit by becoming informed on the latest practice in this line. The Thurman Fuel Oil Burner Company, which has headquarters at 35 and 36 Cordova building, Indianopolis, Ind., with branches in New York, Chicago, Philadelphia and San Francisco, manufactures an oil burner that is undoubtedly the best on the market, and which is especially adapted to use on yachts. The system generates pure hydrocarbon gas with a minimum amount of oil, utilizing every unit of heat the oil contains. This company has issued a pamphlet containing considerable information relative to the use of oil aboard vessels and the practical application of its burners in this regard, and from any of its offices information on the subject will undoubtedly be furnished on application.

## Water Power Canal Scheme.

If the latest water power canal scheme projected at Niagara is carried out, another big dredging job will be available. The scheme contemplates the construction of a canal 40,000 feet long, commencing on the upper Niagara river some miles above the falls, and discharging into the lower Niagara river near its Lake Ontario mouth. The canal will have a sudden drop at the end of the bluffs forming the high ground through which the river cuts its way, and on the low ground between the bluffs and the lake shore will be established a manufacturing city for utilizing the water power. The canal will be 40 feet wide on the bottom, a water depth of 18 feet in earth, and 25 feet in rock, and side slopes of 1 to 1 in earth, and 1 to 10 in rock. The contracts will be let in eight sections, and the amount of excavation will comprise 4,304,000 cubic yards of rock and 1,318,000 cubic yards of earth, or 5,622,000 cubic yards in all. Whenever the length of haul of the excavated material exceeds 1,000 feet, the contractor will be compensated for the overhaul. The contractor on each section is required to excavate and remove an average of not less than 2,000 cubic yards per working day. The bottom and sides are to be brought carefully and uniformly to the required lines and grades, no depressions more than one foot deep being allowed, and all exceeding that to be filled up by the contractor. As to classification of material, the specifications say that solid rock shall include all rock in ledges, and also detached masses of more than two cubic feet, which in the opinion of the engineer can not be removed without blasting. Earth comprises all material, of whatever nature, that does not clearly come under the classification of solid rock.

## The Boiler Question.

British manufacturers of marine boilers of the Scotch type, and especially such of them as have large plants and a big amount of money invested in the business, are entering strong protest against the adoption of tubulous boilers for some of Her Majesty's war ships. A representative of one of the best-known Clyde firms of ship and engine builders says in a communication to one of the London trade journals:

"I think that we are all inclined to run a little mad after this new craze, and so long as those who are at the head of affairs are urging forward its adoption, so long will the madness continue. So long as the water tube boiler remains one of tubes only, there will be very little danger; but when large steam drums, or receivers of 5 feet or so in diameter, are introduced, then the danger must become apparent; and although it may be urged that these drums are, on account of their size, more than usually strong, if this is so, one of the factors in favor of the water tube boiler—weight—at once disappears. On the other hand, if the drum be made smaller in diameter, and the plates consequently thinner, then what would be an ordinary amount of corrosion, and of little moment in the thick plate, would at once be a dangerous amount in the thin one."

## An Englishman's View of American Ship Building.

J. Stephen Jeans has for many years been a prolific writer on industrial and economic subjects, and as such has many times been quoted both in the United States congress and the British house of commons as an authority on matters pertaining to the iron and steel trades. He is secretary of the British Iron and Steel Institute and the British Iron Trade Association. In the November number of Cassier's Magazine, Mr. Jeans contributes a short article on "English and American Ship Building," in which he directs attention to the great fall in prices of material for steel ships in the United States, and holds that "if the American tariff is to be modified from time to time until it becomes a revenue tariff only, we may depend upon it that the cost of labor in American ship building yards will eventually become accommodated to the necessities of a pan-American ship building policy."

"No recent economic or industrial movement in the United States," he says, "appears to have attracted so much attention in Europe as the remarkable advances made in shipping and ship building, and the revival at all the principal ports on the great lakes, as well as on the seaboard, of what appeared until quite recently to be a decaying, if not an absolutely defunct, industry. This development has found visible and manifest expression in the growth of a new American navy, which has come into being with an amount of vigor and enterprise, which is rare even in the economic and naval annals of the most enterprising countries. Not content with having built within a few years a navy which could give a good account of itself in any naval engagement, except perhaps with the unique and still unmatched naval power of the mother country, American ship builders have been laying themselves out for undertaking work for other powers; they have acquired the two crack vessels of the Inman line, the Paris and the New York, which they are now sailing under the American flag, and they have undertaken the construction of companion ships, which are likely to be equal to the British-built vessels in every way. The development of the ship building industry on the lake ports and the building of such noble and unique craft as the Christopher Columbus for the Chicago exhibition traffic, the Priscilla for the Fall River line, and the new passenger steamer North West for the lake traffic, are all stepping stones on the march of progress toward a higher order of things, which may well inspire American ship builders with hope and courage for the future."

Following this eulogy on the latest efforts of ship builders in the United States, Mr. Jeans refers briefly to the decline of ship building in this country and its development throughout Great Britain since the advent of iron ships. He also summarizes the requests made upon congress since 1860, at one time to declare bounties, at another time to subsidize American tonnage with heavy mail subsidies, at a third time to shut out British tonnage, and at a fourth time to make American ship building a specially protected industry. All these efforts, he concludes, have resulted in failure, for the reason that "the utmost knowledge, the utmost skill and the utmost enterprise, however vigorously and wisely applied, will not enable a country to attain to high rank among ship building nations unless there is allied to these essential qualifications the determining consideration of cheap production. It is from this point of view that American arsenals and ship yards have been behind in the past. Ship building costs are primarily ranged under two main heads—materials and labor. A country that is handicaped in regard to either is likely to find itself at a serious disadvantage. How much more serious is the disadvantage experienced by a country unfavorably situated in reference to both; and yet, this has hitherto been the situation of the United States."

"But what are they likely to do in the future?" the writer asks, and concluding that ship materials are now being furnished to ship builders by the steel manufacturers of this country almost, if not quite, as cheaply as they can be purchased on the Clyde or the Tyne, he holds that the higher labor cost in the United States is a disadvantage more in appearance than in reality, as indicated by such industries as the building of locomotives, elevators and other special productions of the United States. "All the world knows," he says, "that the United States have competed successfully with Great Britain in many outside markets in the locomotive business. Here, indeed, we have a parallel which is in many respects complete. A locomotive, like a modern steamship, is a highly complex and costly machine. It involves a great deal of highly finished mechanical work; it brings into exercise the highest skill of the designer, the builder and the artisan, and yet, as we all know, American locomotive engines are being increasingly built for foreign markets, and may be found all the world over. If the relatively high cost of labor were prohibitory, this could not have happened, even when we have allowed a large margin for the differences of design, which causes the American locomotive to be preferred in some cases regardless of price. The evidence in reference to other branches of American industry, therefore, justifies the statement that high wages do not necessarily mean dear production, and that the payment of a high scale of wages is not necessarily incompatible with pre-eminence in the industries that are chiefly responsible for the maintenance of national prosperity. Had high wages combined with a high cost of materials, the case would have been different. But within the last two years the United States have witnessed a truly marvelous change in this respect."

## An Engineer's Opinion of the Howden Hot Draft.

The management of the Detroit Dry Dock Company sends us the following copy of a letter from John H. Hand, chief engineer of the steel freight steamer Harvey H. Brown—2,202 net registered tons and 2,250 I. H. P.

Mr. G. N. McMillan, Secretary Detroit Dry Dock Company, Detroit, Mich.—Dear Sir: Replying to your inquiry about the Howden hot blast on steamer Harvey H. Brown, I am pleased to say it is the most satisfactory appliance I have run across in my twenty-seven years' experience as a marine engineer, and to my knowledge is the most practical system put on the market. The saving in fuel is fully 20 per cent. over natural draft, or any other system of forced draft that I have had any experience with. The expert's report, which you sent me, tallies with the every-day experience I am having with the Harvey H. Brown, and tells the story better than I can.

JOHN H. HAND,
Chief Engineer steamer H.H.Brown.

Buffalo, N. Y., Oct. 29, 1894.

## Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on Nov. 3, 1894:

| | Wheat, bu. | Corn, bu. |
|---|---|---|
| Chicago | 25,327,000 | 1,139,000 |
| Duluth | 4,170,000 | ..... |
| Milwaukee | 778,000 | ..... |
| Detroit | 1,463,000 | 6,000 |
| Toledo | 3,153,000 | 20,000 |
| Buffalo | 3,177,000 | 308,000 |
| Total | 38,068,000 | 1,473,000 |

At the points named there is a net increase for the week of 221,000 bushels of wheat, and 59,000 bushels of corn.

## Answering Major Ruffner.

Editor MARINE REVIEW: I note in the MARINE REVIEW of the 1st inst , that Maj. Ruffner of Buffalo enters what must be considered a protest against the proposition to investigate the advisability of improving Lake Erie harbors by regulating the level of the lake surface by a dam at Buffalo. It seems somewhat strange,if the proposition is so devoid of merit as Maj. Ruffner would have the reading public infer, that there should be any opposition to having the whole matter investigated by an international commission of engineers. If Maj. Ruffner is correct, certainly such a commission would shelve the project so effectually that it would never be heard of again.

The strangest part of this whole business is that Maj. Ruffner bases his opinion on the amount of discharge of Niagara river as determined under his direction in 1891 and 1892, and from which he has deduced and published formulas that indicate that the deeper the water is in Niagara river the smaller will be the outflow. It requires no hydraulic expert to know that such results are absurd and worthless. Maj. Ruffner is an educated, intelligent engineer, and it would require strong evidence to convince one that he does not know the values he quotes are erroneous. He must be well aware that the proposed plan to regulate the lake level by a dam at Buffalo in no way whatever contemplates restricting the outflow through the head of Niagara river, nor in any way interfering with the navigation between the lake and the ports down the river, yet he deliberately sets up such a straw dummy to knock down.

What if the lake is now passing through a period of low water years? Is not such a period likely to occur again, and if so, what is the navigation interest to do during such periods? What its advocates claim for the regulating dam at Buffalo, is that the fluctuation of the lake surface from wet to dry seasons, which under present conditions may exceed 4 feet, may be so reduced as to be not much greater than 6 inches. Now if this regulated lake level be fixed at the high water level of the lake, it is nonsense to talk about the great damage to arise from completing such an undertaking. If works to produce such a result can not be constructed, the international commission, asked for by the Cleveland chamber of commerce, and by the recent deep waterways convention, will certainly so report. It would appear clear that the only satisfactory way to have all these questions settled is to insist on such a commission being appointed and see to it that its members are capable and honest engineers. Newspaper discussion with the data at command will decide nothing.

In the Engineering News for March 9 and May 11, 1893, Mr. Wisner of Detroit claimed that Maj. Ruffner's report of outflow of Niagara river was wholly unreliable, and offered to pay all legitimate expenses of a re-survey if such was not found to be the case. Maj. Ruffner did not attempt a reply or an explanation of his results, although he will not for a moment impeach the high professional standing of Mr. Wisner.

It would seem that the only course open to all in favor of permanent and economical improvement of Lake Erie harbors is to insist on the appointment of a competent commission. Neither the Cleveland chamber of commerce nor the deep waterways convention has committed itself to the support of a plan obstructing Niagara river. What both organizations have done is simply to call attention to the fact that many of our best engineers, and some of them in the military service, as is Major Ruffner, and such authorities as Mr. Cooley of Chicago, and Mr. Wisner of Detroit, are thoroughly committed to the practicability of the scheme. Both the Cleveland chamber of commerce and the deep waterways convention took a very conservative course and simply asked for the appointment of an international commission to investigate the matter, at the same time securing reliable data as to the discharge of waters at Niagara. In this Maj. Ruffner should certainly join us; if the facts are with him it will only reflect credit upon a name now deservedly honorable, and establish for all time the accuracy of his views. In opposing the appointment of such commission, if in fact his letter must be so interpreted, he is certainly assuming an attitude to be regretted. As one dealing with exact sciences, he of all men should not be afraid of the facts.

CHAS. E. WHEELER,

CLEVELAND, Nov. 6, 1894.

## In Support of the New Aids to Navigation.

In order to furnish the light-house board with information relative to accidents showing the necessity of the new aids to navigation, for which the vessel owners are to make application at the next session of congress, Secretary Keep has addressed the following circular letter to members of the association, and he will, of course, be thankful also for information along the same line from captains or others in any way interested in the lake marine:

To the Members of the Lake Carriers' Association:—The association is about to apply to congress for appropriations for new aids to navigation at the following points:

1. Light and signal on North Manitou island.
2. Light and signal on Middle island, Lake Huron.
3. Range lights at Death's Door passage, Lake Michigan.
4. Light and signal at Crisp's point, (west of White Fish point), Lake Superior.
5. Gas buoy on Gravelly island, Poverty passage, Green bay, Michigan.
6. Gas buoy on Lansing shoal, north of Squaw island, Lake Michigan.
7. Fog signal at Eagle Harbor, Lake Superior.
8. Fog signal at Cat Head point, Lake Michigan.
9. Pier lights at Grand Marais harbor of refuge, Lake Superior.

I have been asked by the light-house authorities to furnish them with as much detailed information as possible, showing the necessity of these lights and signals. The purpose of this information is to assist the light-house board to secure the necessary appropriations from congress. Please advise me whether any of your boats have had trouble at any of these points, giving me such information as to date, nature of accident, and amount of loss, as you may be able to furnish. Any information which you or the masters in your employ can send me will be of great assistance in obtaining provision from congress for these important improvements. To be available, information should reach me before Nov. 20, 1894.

C. H. KEEP,
Secretary.

BUFFALO, N. Y., Nov. 5, 1894.

## A Gain in Flour Receipts Only.

Although anthracite coal shipments out of Buffalo this season will, if the present movement is continued throughout November, be almost equal to the shipments of last season, there will be a big falling off in receipts at that port of everything excepting flour. Coal shipments for the first week of November aggregated 115,780 tons, an amount very much above the average. Following is a table showing shipments by months to Nov. 1, 1893 and 1894:

| | 1893, Tons. | 1894, Tons. |
|---|---|---|
| April | 178,040 | 110,997 |
| May | 363,435 | 230,747 |
| June | 391,580 | 384,663 |
| July | 254,070 | 318,672 |
| August | 252,945 | 253,988 |
| September | 290,168 | 264,910 |
| October | 395,465 | 389,378 |
| Totals | 2,089,703 | 1,953,355 |

Gain in flour receipts for the season so far amounts to about 1,000,000 barrels, while grain receipts are over 34,000,000 bushels short of the receipts in 1893. Receipts on the whole, with flour included as grain, show a falling off of 29,621,950 bushels as compared with 1893. Lumber receipts to Nov. 1 aggregate only 173,987,620 feet, against 228,132,800 feet on the same date in 1893—a decrease of 54,145,180 feet.

## Notices to Mariners.

The front range light at Kewaunee, Wis., has been discontinued. The pierhead tower has been moved to a point 3 feet from the end of the pier and the former rear light is exhibited from this point without change of characteristics.

The tower at Rock island light station, on Rock island, St. Lawrence river, has been increased 5 feet in height, and the light is now visible above the roof of the keeper's dwelling in the direction of the dock at Thousand island park. At the close of navigation this season the fixed white reflector light shown from the veranda of the keeper's dwelling in the direction of the dock at Thousand island park will be permanently discontinued.

Light-house officers will evidently endeavor to comply with the wishes of vessel owners regarding the removal of buoys and discontinuance of lights toward the close of navigation this season. Commander Gridley of Buffalo, inspector of the tenth district, announces that the buoys in the rivers and the light-ships of the district will be kept in position up to Dec. 10, if weather will permit. The tenth district includes lake and river waters of the United States below Detroit.

## He Let Go the Painter.

Every sailor has his story of the mistakes which "landlubbers" make over the names of things at sea, which always seem to be exactly the opposite of what they are on land.

A new boy had come on board a West India ship upon which a painter had also been employed to paint the ship's side. The painter was at work upon a staging suspended under the ship's stern.

The captain, who had just got into a boat alongside, called out to the new boy, who stood leaning over the rail, "Let go the painter!"

Everybody should know that a boat's painter is the rope which makes it fast, but this boy did not know it. He ran aft and let go the ropes by which the painter's staging was held. Meantime the captain was wearied with waiting to be cast off.

"You rascal," he called, "why don't you let go the painter?"

"He's gone, sir," said the boy briskly. "He's gone, pots, brushes and all.—Tit Bits.

# MARINE REVIEW.

*DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.*

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O.

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.


The books of the United States treasury department contain the names of 3,341 vessels, of 1,227,400.72 gross tons register in the lake trade. The lakes have more steam vessels of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of steam vessels of 1,000 to 2,500 tons on the lakes on June 30, 1894, was 318 and their aggregate gross tonnage 525,778.57; in all other parts of the country the number of this class of vessels was, on the same date, 211 and their gross tonnage 314,016.65. The classification of the entire lake fleet on June 30, 1894, was as follows:

| Class. | Number. | Gross Tonnage. |
|---|---|---|
| Steam vessels | 1,731 | 843,239.65 |
| Sailing vessels | 1,139 | 302,985.31 |
| Canal boats | 386 | 41,961.25 |
| Barges | 85 | 39,214.51 |
| Total | 3,341 | 1,227,400.72 |

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

| | Number. | Net Tonnage. |
|---|---|---|
| Year ending June 30, 1889 | 225 | 107,080.30 |
| " " " 1890 | 218 | 103,515.00 |
| " " " 1891 | 204 | 111,856.45 |
| " " " 1892 | 169 | 45,168.98 |
| " " " 1893 | 175 | 99,271.24 |
| Total | 991 | 471,891.97 |

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

| | St. Mary's Falls Canal. | | | Suez Canal. | | |
|---|---|---|---|---|---|---|
| | 1893. | 1892. | 1891. | 1893. | 1892. | 1891. |
| No. vessel passages | 12,008 | 12,580 | 10,191 | 3,341 | 3,559 | 4,207 |
| Ton'ge, net regist'd | 9,849,754 | 10,647,203 | 8,400,685 | 7,659,068 | 7,712,028 | 8,698,777 |
| Days of Navigation | 219 | 223 | 225 | 365 | 365 | 365 |

*Entered at Cleveland Post Office as Second-class Mail Matter.*

IN HIS annual report to the secretary of the navy, Chief Naval Constructor Hichborn again makes a strong plea for an appropriation for the construction of an experimental tank, in which wax models of proposed new war ships are to be tested with a view of reaching some definite conclusion regarding their probable speed. It is not right that the navy department of our government should be handicaped in this regard. Even some of the private ship building establishments of European countries are equipped with these tanks and there is no question of their great value. This subject has been referred to on several occasions in the REVIEW, and as suggested in such reference, it would seem that the navy department could, if provided with a tank and the appliances attending it, conduct an extended series of experiments with various models of merchant vessels that would give to the ship builders of this country a vast amount of scientific information that is hidden in places where tanks are now in use, on account of influences surrounding them. As suggested by Mr. Hichborn, such a tank would greatly reduce premiums now paid to builders of naval vessels, and it would also show weak points in the design of a vessel that could be corrected before the keel was laid. He adds, however, that the bureau in no sense desires to depart from the custom of giving premiums for speed in excess of that stipulated in the contract. "Past experience proves most conclusively," he says, "that the inducement of a substantial speed bonus compels a contractor to use his utmost endeavor to allow none but the best material and workmanship to enter into the construction of the propelling machinery, thereby insuring to the navy a high quality of work, such as could not be obtained by any mere system of government inspection, no matter how rigid."

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STATE Labor Commissioner Lewis, of Ohio, says that a discussion of lake business and labor conditions among dock men and sailors at Ohio ports on Lake Erie will form an important feature of his coming annual report, and that some of the conclusions reached regarding labor conditions are not likely to be specially flattering to the shipping interests of Northern Ohio. Mr. Lewis seems to be of the opinion that the vessel interests of Cleveland and other Ohio ports tried to cover up information regarding relations between employers and employes, when agents of the state labor bureau sought to collect statistics here during the past summer. He is mistaken. The difficulty rested in the fact that the agents had no knowledge of the lake business, and the kind of blanks furnished by the bureau for reports from the shipping interests were made up without a knowledge of the various peculiar conditions attending lake business as against a degree of uniformity in methods pursued by manufacturing establishments and other industries ashore. If Mr. Lewis attempts to discuss any feature of the lake business from unreliable reports furnished by two agents after an inquiry extending over a few weeks, the result will certainly be ridiculous. He makes one good point, however, in calling attention to the absence of a law that would make available a full list of every crew leaving port. It has frequently happened in recent years that vessels have been lost and complete rosters of crews never have been found. But this is a matter that belongs to the government authorities, who have as much to do with vessels of the lakes as they have to do with sea-going vessels, and it would seem that the Lake Cruisers' Association should take up the subject and dispose of it before more unfavorable comment is heard regarding it.

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IN THE REVIEW of the 1st inst., there was printed a communication from Major Ruffner of Buffalo, corps of engineers, U. S. A., in which that gentleman discussed the probability of water levels on the lakes being materially affected by the flow from Lake Michigan westward that will occur when the Chicago drainage canal is opened. It is not probable that vessel owners of the lakes will take any action with reference to the present agitation of this subject, as they feel that it was some time ago discussed as fully as it could be with the data at hand, and as leading vessel owners now put it, the work at Chicago is too far advanced to make any move to arrest its progress at this time. But Major Ruffner takes up another subject—that of the probable effect on Lake Erie harbors of a dam at Niagara. He takes exception to the action of the Cleveland chamber of commerce and the recent water ways convention in asking for the appointment of a commission of engineers to settle matters pertaining to the outflow of the lakes. In this he is answered, in another part of this issue, by Mr. Charles E. Wheeler, superintendent of transportation, Cleveland chamber of commerce. Mr. Wheeler writes, of course, on his own account and not in behalf of the chamber of commerce. This outflow problem is important and we expect to have more to say about it later on.

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VARIOUS reports are in circulation regarding a probable change in control of the light-house board when Admiral Greer, the president of the board, is retired shortly. It is said that the engineer corps of the army has long coveted control of the board, and that the president and Secretary Carlisle are inclined to act favorably toward army control of the service upon the reorganization that is to occur soon. On the other hand it is announced on seemingly good authority that the president is to restore to the service Capt. Robley D. Evans with probability of his election to the head of the board. If the service is to remain under navy control, the election of Capt. Evans to the presidency would certainly not result in objection from lake interests.

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FIGURES published elsewhere give an abstract of lake business at Buffalo to Nov. 1, as compared with the same date last year. Although a gain of 1,000,000 barrels of flour is indicated by the statistics, they show a loss of about 30,000,000 bushels in grain of all kinds, including flour as grain. Of course it is well known that Buffalo's shipments of anthracite coal are somewhat short of last season's movement, and in lumber there is also a shortage of about 50,000,000 feet. As Buffalo is the principal grain receiving port, it is now evident, more than ever, that the iron ore shippers have been the supporters of lake freights, and they would have had some stiff rates to pay if competition from grain had been at all active.

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IN MATTERS pertaining to harbor improvements at Cleveland, the chamber of commerce shows a disposition to exert its full influence with both the city government and the authorities at Washington. Through its influence an opening is to be made in the western arm of the breakwater. An order to begin the work has been received by Col. Jared Smith, the engineer in charge, from Gen. Casey, chief of engineers, war department. The change is made for sanitary and commercial purposes. It will free the breakwater enclosure of polluted water and it is expected to create a current that will prevent the entrance, as well as the greater part of the basin, from gradually filling up with sediment.

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THE STATEMENT that on Nov. 1, there was over $1,000,000 excess of premiums over losses in insurance business on the lakes called out objection from the general agents of the insurance companies. It is certain, nevertheless, that the profits of insurance companies so far this season have been very heavy, and unless the balance of the season should prove very disastrous, the losses in proportion to the present size of the lake fleet will be smaller than for a great many years past. The poorer class of risks have not been taken at all this season. The owner of moderate means has suffered, more than ever, from the choice of no insurance or very heavy premiums.

## A Complete Description of the City of Everett.

Capt. F. D. Herriman, lake representative of the Bureau Veritas, has just returned to Chicago from a trip to Everett, Wash., where he went to inspect and witness the launch of the ocean whaleback steamer City of Everett. He favors the REVIEW with a technical description of the Pacific-built steamer, which is printed below, and which will undoubtedly be read with interest. Capt. Herriman is very favorably impressed with the advancement made in manufacturing enterprises at Everett since the place was selected as a site for a seaport and manufacturing city, a little more than three years ago, and he writes very interestingly of the iron works, wire nail and steel works, pulp and paper mills, ship yard, smelting works, saw mills, canneries and other industries which have grown up in the favored young city that is now looked upon as a trans-continental terminus with a most promising future. But his description of the first steamer built in the new city, the steel whaleback City of Everett, the launch of which was attended by fully 10,000 people, with the governor and staff of the state of Washington, is of most interest to readers of the REVIEW.

The entire length of the new boat is 361 feet; her length on the deep load line, 338 feet; beam, moulded, 42 feet; depth, moulded, 26 feet 6 inches; tabular depth, 25 feet; tabular number of cubic feet, 369,096. Her proportions are extreme, as she has 8 beams and 13½ depths, respectively, to her length, compensating for same by increased scantlings. Her engines, built by the Frontier Iron Works of Detroit, Mich., are vertical, direct acting triple expansion, with cylinders 24, 38 and 64 inches, with 42 inches stroke of piston. She has four boilers of the Scotch type, 11 feet by 12 feet, and eight furnaces. Boilers are allowed 165 pounds steam pressure. The diameter of the propeller is 14 feet and the pitch 18 feet. The capacity of the bunkers is about 400 tons of bituminous coal and the daily consumption twenty-four tons; expected speed, 12 knots.

The Everett is of medium model, grading between full and sharp, with easy bilges and fair spring on the sheer line. All shell plating butts are overlapped and treble riveted, except the three strakes of deck on either side of hatchways, which have compared butts with double butt straps, treble and quadruple riveted. She has a 42-inch continuous water bottom with deep center keelson and five rider keelsons on either side, all properly connected by continuous longitudinal and vertical angles and brace plates. Her frame angles, waich are spaced 24 inches apart, are joined at the tops, forming a hoop, and when combined with the reverse frames are capable of greater binding resistance than the ordinary frame of the same seetional area. Her quarter pillar stanchions are of I steel secured to the main deck beams and to the longitudinal girders, head and foot. Between the main deck stringer plate and the upper deck hatch ends are two continuous stringer plates supported on either side by strong bulb angles, and in the hold between the main deck stringer and the tank top are two similar stringers. On either side of the ship all plates between the stringer angles are let intercostal and riveted to the shell plating, the vertical space between the stringers not exceeding 5 feet, while 8 feet is allowed by ocean rules. Her web frames are spaced 16 feet and extend from the tank top to the second stringer of the deck plating; faced with double reverse angles and secured to stringers with double horse shoe plates.

There are seven water tight bulkheads, three of which extend to the upper deck and are properly supported vertically and horizontally. These include two collision bulkheads, one 10 feet and the other 46 feet from the drum head, or extreme fore peak. A fully laid steel deck divides the space between the collision bulkheads, and it is supported below by a fore-and-aft bulkhead, or center keelson, while pillar stanchions on either side to alternate floors support the overhanging bow and deck as well. The face plate or drum head is of ¾-inch steel, and convex, with riveting flange turned on the same. It is supported on the inside by knee plates connected to stringers and frames forming a massive cross. The deck or whaleback is pierced for five hatchways, 8 feet by 10 feet, and which are equally distributed between the machinery and windlass turrets. At each hatchway there is a steam cargo winch and also a pole mast enclosed by a steel turret. The saloon and steering deck is well aft and is supported by turrets and steel pillars. The boat's appointments are of the latest type, the windlass, capstan and steering appliance being worked by steam, and she is electrically lighted throughout.

This vessel is built to the rules and scantlings' tables of the Bureau Veritas for ocean work under the supervision of an inspector of the society and will receive the highest class in the Register Veritas.

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Commander W. H. Mead of Detroit, inspector of the eleventh lighthouse district, announces that buoys in Lake Huron will be taken up and winter buoys substituted about the middle of November. The buoys in St. Clair and Detroit rivers, also light vessels, will be kept in position as late as weather will permit.

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"ROPER'S LAND AND MARINE ENGINES," BOUND IN MOROCCO WITH FLAP AND POCKET, WILL BE MAILED TO ANY ADDRESS FOR $3.50 SENT TO THE MARINE REVIEW, CLEVELAND, O.

## Around the Lakes.

Dunbar & Sullivan's dredging contract on the Lachine canal is said to be one of the largest they have ever undertaken.

Shipments from the Oliver mine, one of the leading Mesabis, have passed the 500,000-ton mark, and 25,000 tons more may be added to the output before the close of the season.

A case was not made against Capt. Byrne of the steamer Owego, who was charged in the United States court at Detroit with permitting ashes from his steamer to be dumped into the St. Clair canal, and he was discharged.

The motion of defendants for a new trial in the case of the owners of the steamer V. Swain against the Insurance Company of North America, which attracted a great deal of attention in the United States district court at Cleveland a short time ago, has not been disposed of as yet.

Surveying has been begun between Hamilton, Ont., and Grand river with the object in view of building a canal between the two points, and utilizing the water of Grand river for power purposes. A rough estimate of the fall at Hamilton places it at about 300 feet. A. C. E. Pew, Royal Hotel, Hamilton, is one of the promoters of the scheme.

Frank E. Kirby, engineer, and Gilbert N. McMillan, secretary and treasurer of the Detroit Dry Dock Company, will attend the launch of the new American Line steamer St. Louis at Cramps, Philadelphia, on Monday next, and on the 17th inst. they will sail for Europe on the Campania, to be absent about six weeks. Their time will be wholly devoted to visiting the great Scotch and English ship building establishments, and they will avail themselves of any valuable new points to be obtained relating to their business.

Judge Swain of the United States district court, Detroit, has granted an order allowing the owners of the steamer Wilhelm to avail themselves of the law limiting their liabilities to the value of the boat in the decree obtained against the Wilhelm for the loss of the barges Mears and Midnight in the storm of November, 1889, on Lake Huron. The amount of damages awarded by the United States circuit court of appeals is more than the value of the Wilhelm. The judge named Alex McVittie of Detroit as trustee to sell the Wilhelm and divide the proceeds

Capt. James Davidson was in Cleveland Wednesday on his way home from Erie, where he had gone to look after the release of the steamer Monohansett, which went ashore in the bay at that place after dropping anchor during a blow. The boat was badly stranded, as she had gotten inside of a bar previous to a lowering of the water, but she was released with very little expense, by calling to her assistance the steamer Nicaragua, another of the Davidson boats that was bound up light from Buffalo. The Nicaragua dredged a channel around the stranded boat and released her in a few hours.

There is no truth in the report that M. A. Hanna & Co., new owners of the big Chapin mine, have made arrangements to unwater the Hamilton and Ludington mines and work them in connection with the Chapin, using pumping machinery and other appliances of the Chapin on all three of the mines. Of course there is a possibility of such a combination being effected, but it has not been talked of by the owners of the mines, and is not probable, on account of the great depth of the smaller mines and the heavy expense that would attend the unwatering and operation of them in these times of low prices for their product.

The Western Transit Company of Buffalo will evidently make a salvage claim for saving the steamer D. M. Wilson from going down in deep water on Lake Huron a few days ago. Capt. Angus MacDonald of the steamer Hudson states that the Hudson was wholly instrumental in getting the Wilson into shallow water. He says that he might have put her on the beach, but that would have exposed her to storms and almost certain destruction. Where she now is she can be raised easily. Capt. MacDonald claims that the crew of the Wilson did not seem very anxious to save their boat, and reports that although her captain said when he first took hold of her that she was nearly full of water and would not remain afloat fifteen minutes, he towed her for six hours afterward. He also claims that the steamer John Mitchell rendered service of very little account, as she had hold of the Wilson for only a few minutes.

Grand Haven, Mich., New York and San Francisco are the the three distributing points of supplies for the life saving service districts on the great lakes—ninth, tenth and eleventh. The superintendent of the ninth district is located at Buffalo. and his territory consists of the American shores of Lakes Erie and Ontario. The tenth has for its territory the American shores of Lakes Huron and Superior, and its superintendent is located at Sand Beach. The eleventh consists of twenty-six stations upon the shores of Lake Michigan and Green bay, with Nathaniel Robbins, Sr., of Grand Haven, superintendent. All the requisitions for supplies for the different stations of the three districts are passed upon by Mr. Robbins. The law requires that stations on the lakes shall be kept open from the opening to the close of navigation, and leaves it with the superintendent of the district to decide when the opening and closing of navigation occurs at the stations in his district.

## Illustrated Patent Record.

SELECTED ABSTRACTS OF SPECIFICATIONS OF A MARINE NATURE—FROM LATEST PATENT OFFICE REPORTS.

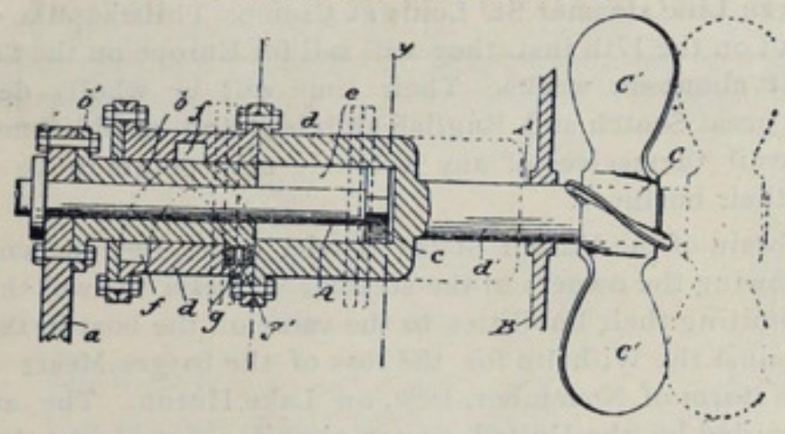
528,138. **Propelling Apparatus.** Benny Bernstein, New York, N. Y. Filed Dec. 22, 1893. Serial No. 494,448.

Claim.—A propelling apparatus consisting of a bearing sleeve rigidly secured to a fixed support, a segmental guide swiveled to the said bearing sleeve, a hub rotatable and reciprocable upon the bearing sleeve, the said hub being formed in two portions bolted together, the forward being formed with an internal figure S-shaped cam-groove, adapted to receive the guide carried by the bearing sleeve, the rearward part of the hub being provided with a longitudinal recess, a shaft extending from the said hub through the wall of the vessel and carrying the propeller blades, a driving shaft journaled in the fixed support and in the bearing sleeve, and provided at its end with a spider adapted to register with and work within the longitudinal recess in the rearward part of the hub, the said bearing sleeve and the hub being located within the body of the vessel.

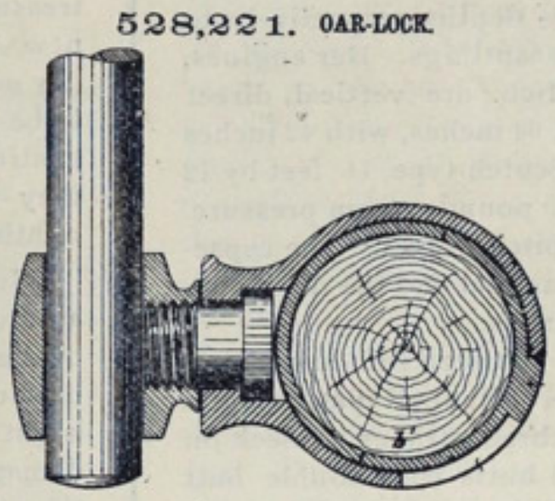
588,221. **Oar Lock.** Heinrich Brinkmann, Munich, Germany. Filed April 20, 1894. Serial No. 508,324.

Claim.—The combination, with a fixed erect stud, and an eye movable thereon in a horizontal plane, of a sleeve provided with a stud-opening and with a recess at the inner end of the stud-opening, and a connecting stud inserted in the stud-opening and attached to the eye, said connecting stud having a head movable in the recess in the sleeve.

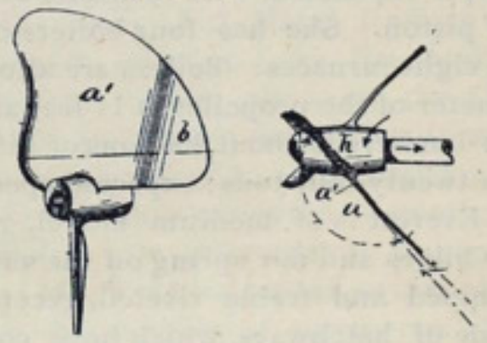
528,138. PROPELLING APPARATUS.



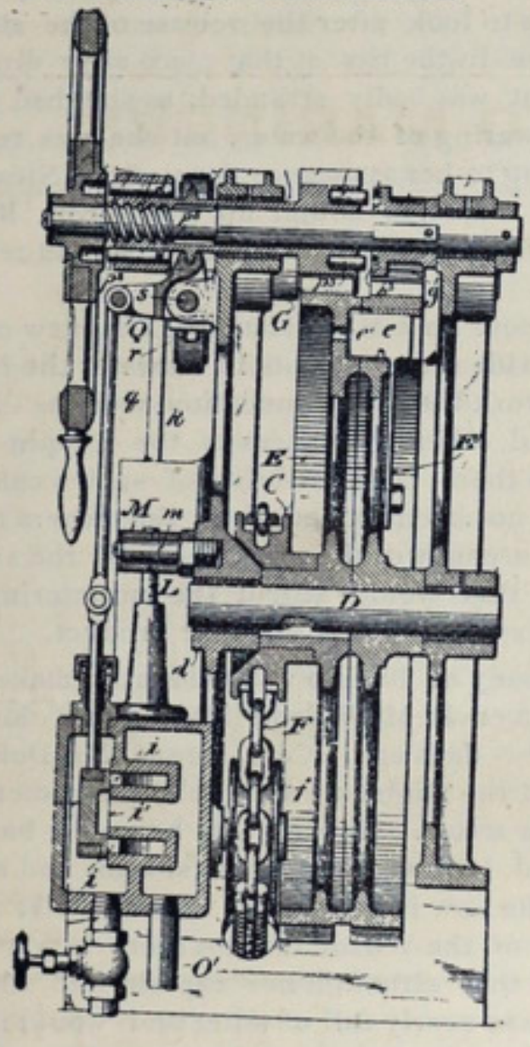
528,221. OAR-LOCK.



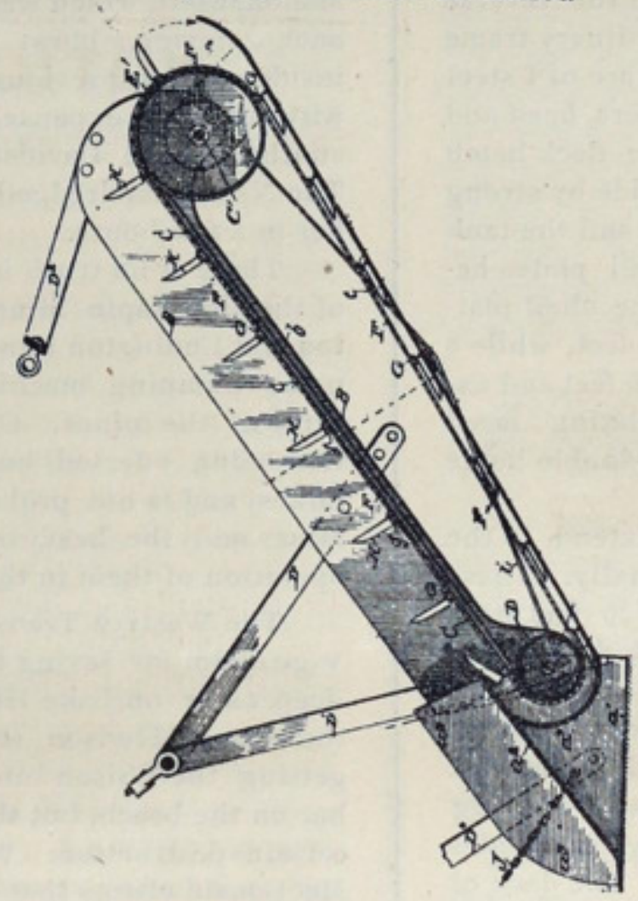
528,253. SCREW-PROPELLER.



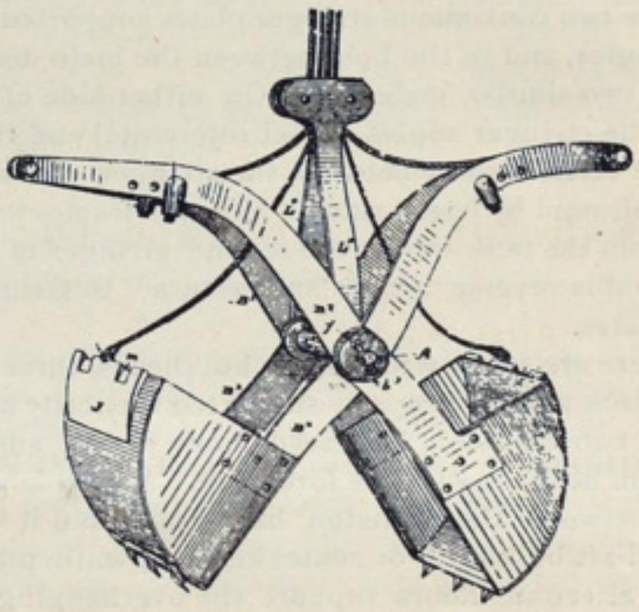
528,356. STEERING-ENGINE.



528,433. DREDGING APPARATUS.



528,375. DREDGING IMPLEMENT.



528,253. **Screw Propeller.** William H. Jay, Providence, R. I. Filed Dec. 13, 1892. Serial No. 455,032.

Claim.—A screw propeller consisting of a hub portion, adapted to be fixed to a driving shaft, and having a plurality of bent blades *a* secured to or integral with said hub; each of said blades having a forward or leading portion *b* bent inboard and a main portion *a'* arranged at an angle therewith exceeding one hundred and eighty degrees, and having the rear or releasing portion *c* of said main part bent reversely toward the shaft, whereby leading portion of blade has a coarser pitch than main portion.

528,356. **Steering Engine.** Matthias A. Beck, Milwaukee, Wis. Filed Aug. 24, 1892. Serial No. 443,958.

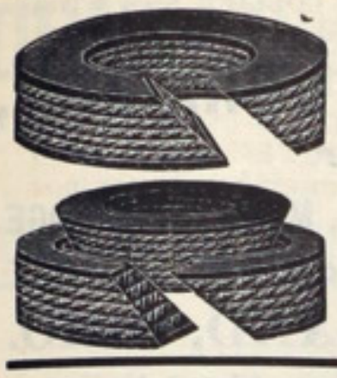
Claim.—First, in a steering gear for boats, the combination of a windlass, a motor connected therewith, a steering wheel capable of limited movement without effect upon the windlass, and connection between the steering wheel and motor whereby the motor is started by the initial movement of said wheel in either direction and is stopped automatically when the windlass is moved into a position corresponding with the position in which said wheel is stopped. Second, the combination with a suitable drum, of a gear fixed upon the drum shaft, an engine connected with said gear, a reversing valve controlling the movement of the engine, a steering wheel having a screw threaded shaft, a sleeve mounted upon said shaft in engagement with the screw thread thereon and provided with a gear engaging with the gear on the drum shaft, and with clutch formations adapted to engage corresponding clutch formations fixed upon the steering wheel shaft, and a connection between said sleeve and the reversing valve of the engine.

528,433. **Dredging Apparatus.** Frank A. Hyaitt, Beaumont, Tex. Filed Jan. 5, 1894. Serial No. 495,812.

Claim.—In a dredge, the combination with a plow, whose rear side is concave, of a frame pivoted to said plow, an endless chain elevator running on drums mounted in said frame, the lower drum being arranged in the concave, as shown, and the buckets of such elevator being hinged and adapted to fold parallel to the frame, and guide bars attacted to the under side of said frame, and having their lower ends arranged in coincidence with the concave of the plow.

528,375. **Dredging Implement.** Caspar Meier, San Francisco, Cal. Filed Oct. 19, 1893. Serial No. 488,626.

Claim.—In a dredging machine of the kind having hinged scoops, the combination, with the hinged scoop, of the fixed bottom plate on the leading edge of each scoop, the removable top plate on the inner side of the scoop over the fixed bottom plate, the edge whereof is beveled in the opposite direction to the corresponding edge of the said bottom plate, and the wedge shape teeth or projection secured under the bottom plate and extending forward beyond the cutting edge formed by the beveled plates, the said teeth being recessed for the bottom plate and having a curved bottom face tapering from the heel upward to the point.



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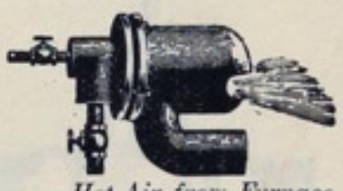

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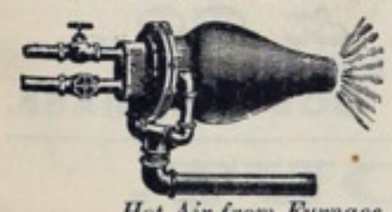

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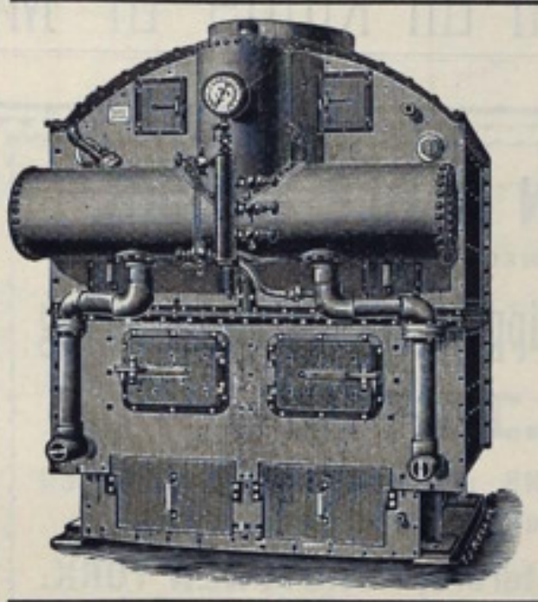

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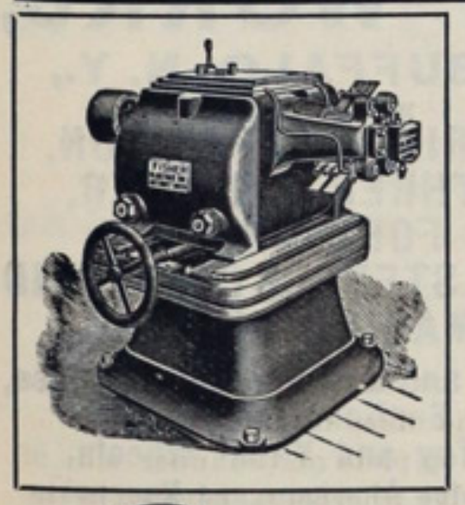

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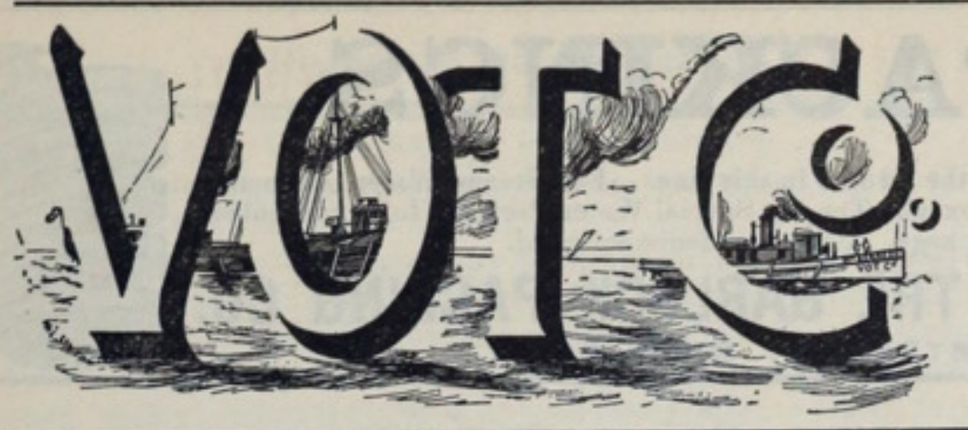


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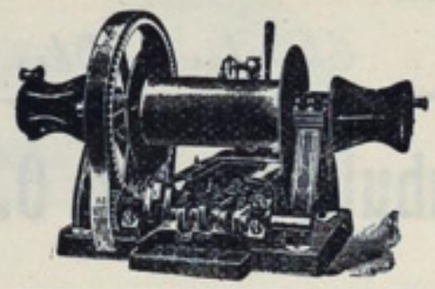

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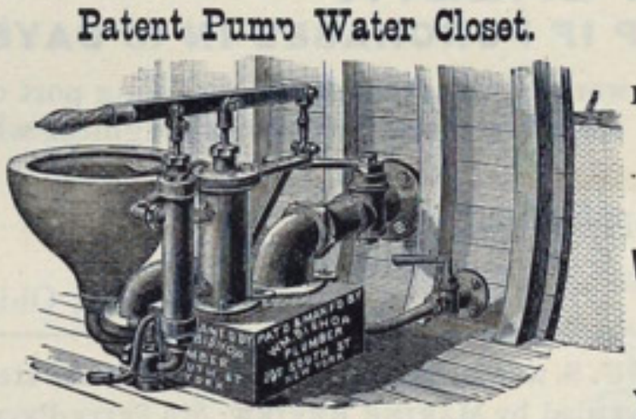

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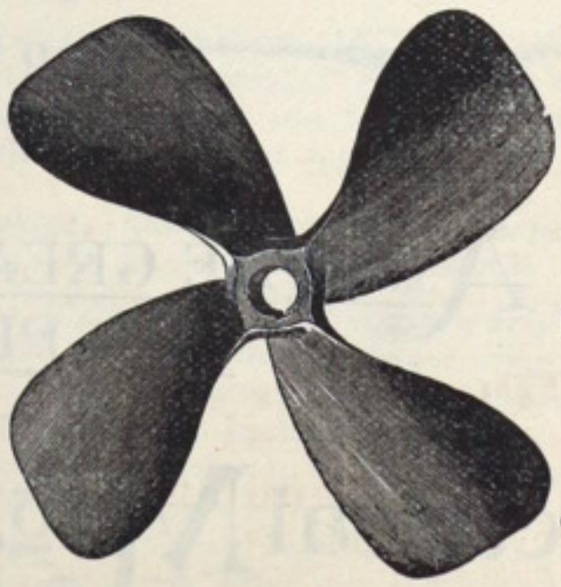

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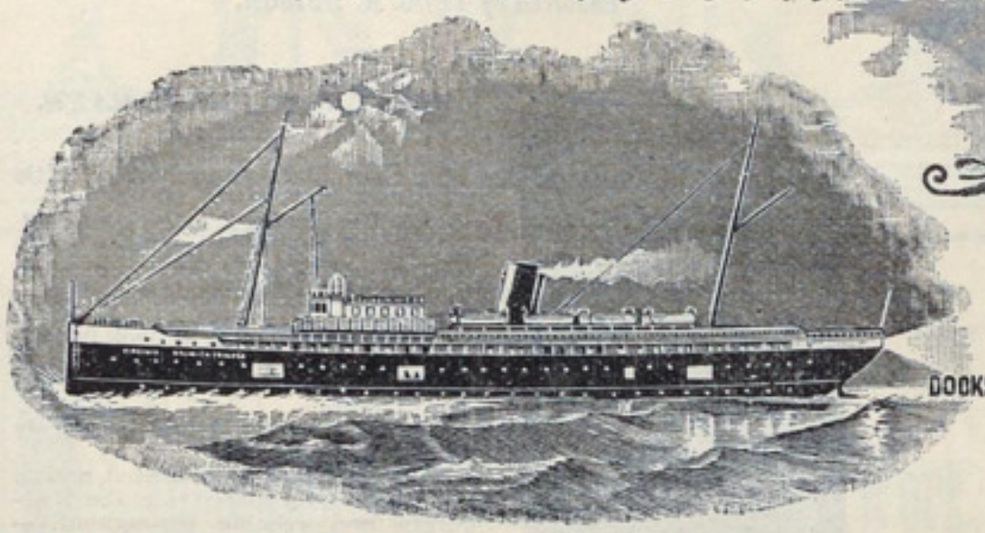

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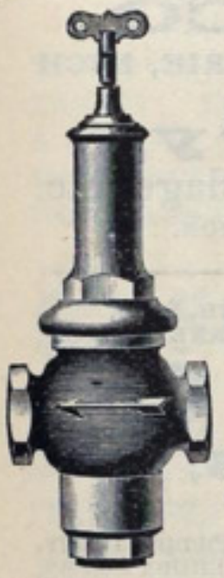

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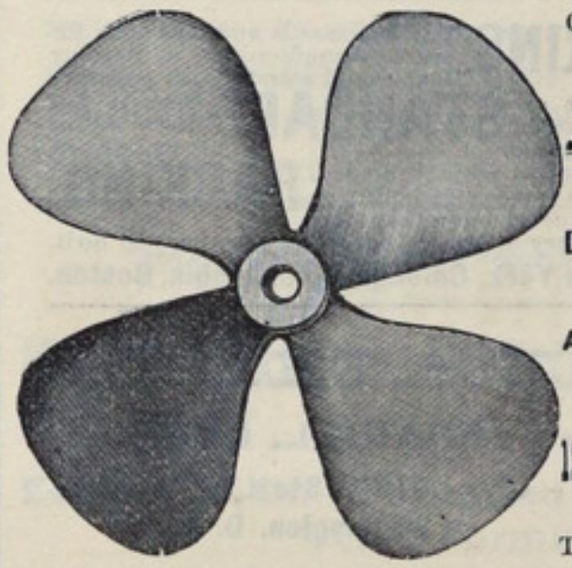

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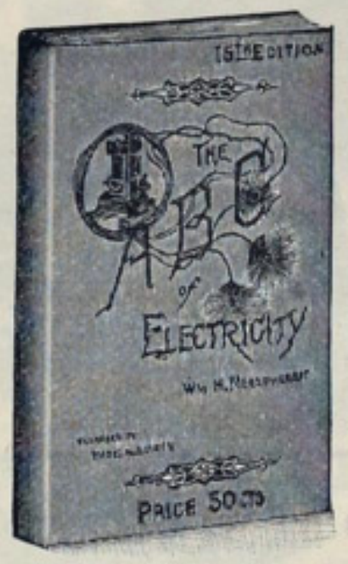


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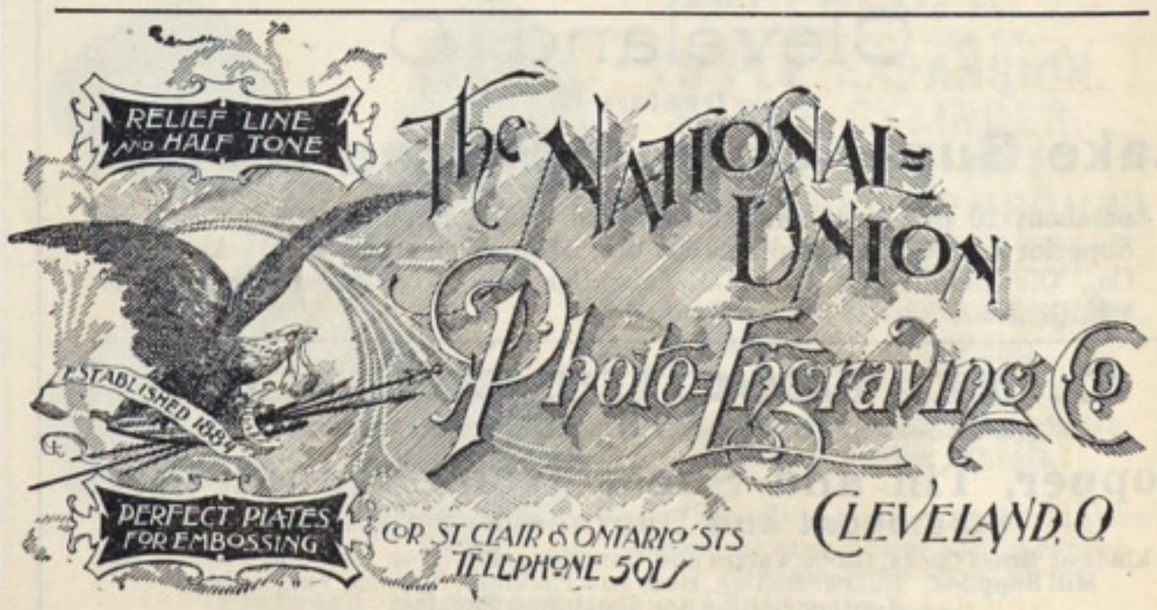

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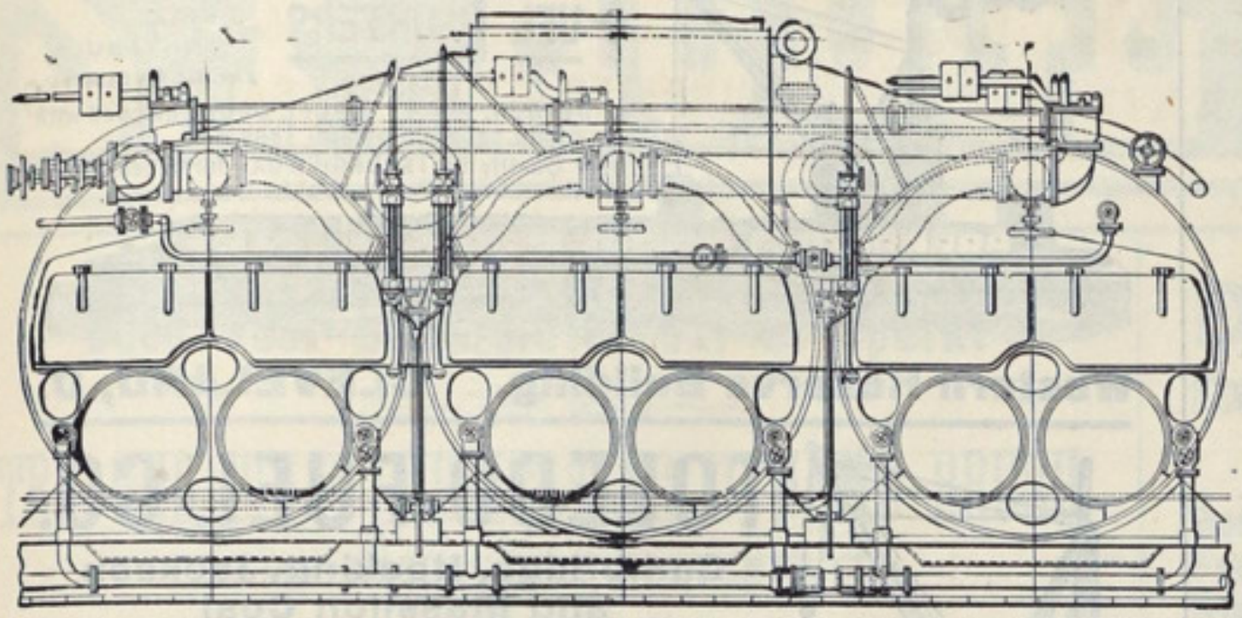

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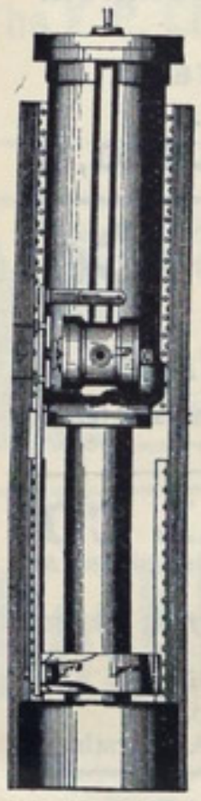

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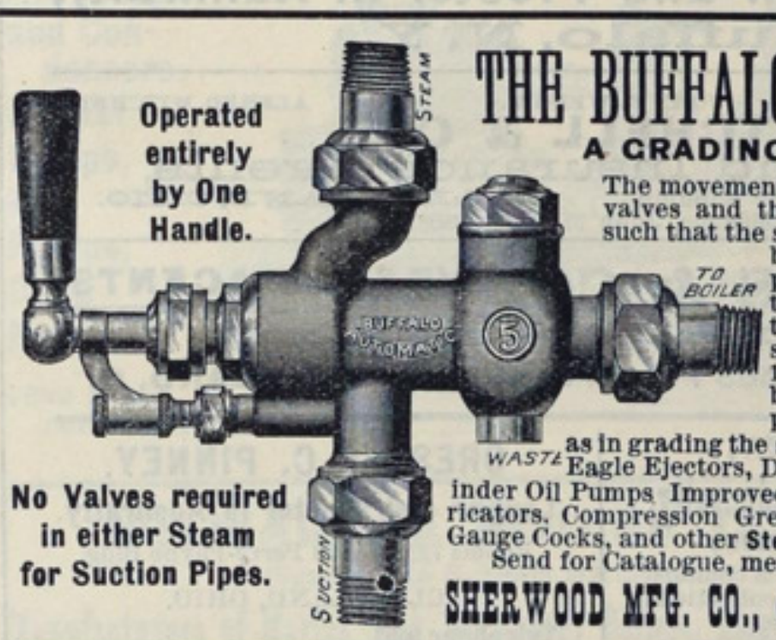


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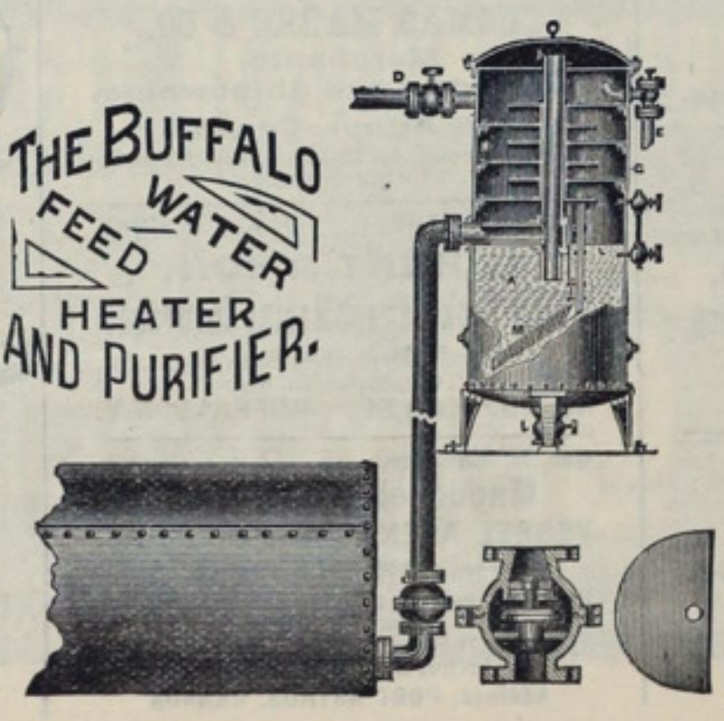

REFERENCES.

A.—Settling chamber.
B.—Boiler.
C.—Feed pipe to boiler.
D.—Steam pipe.
E.—Water supply pipe.
F.—Check valve.
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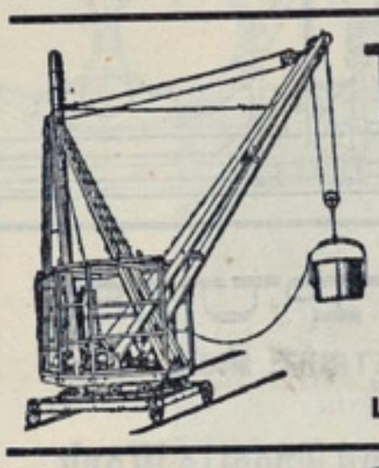

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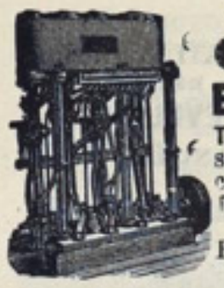

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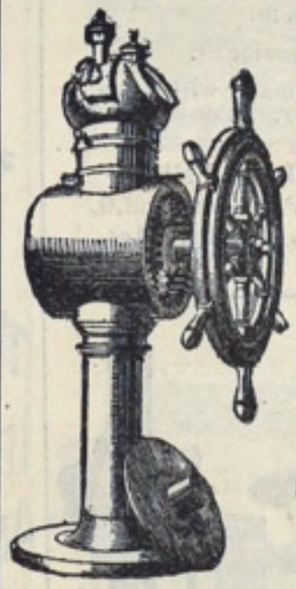

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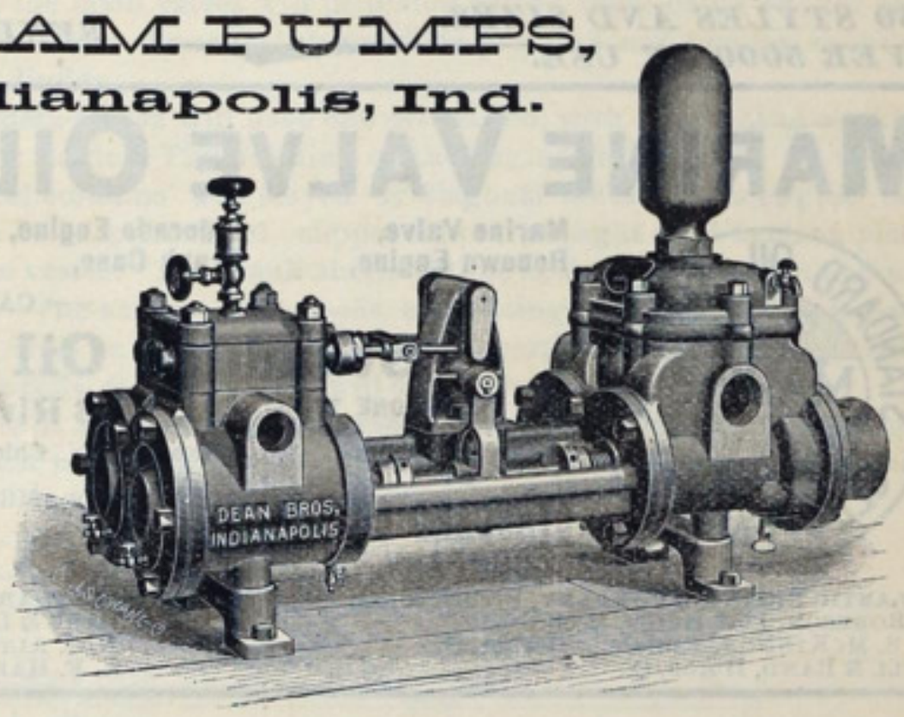


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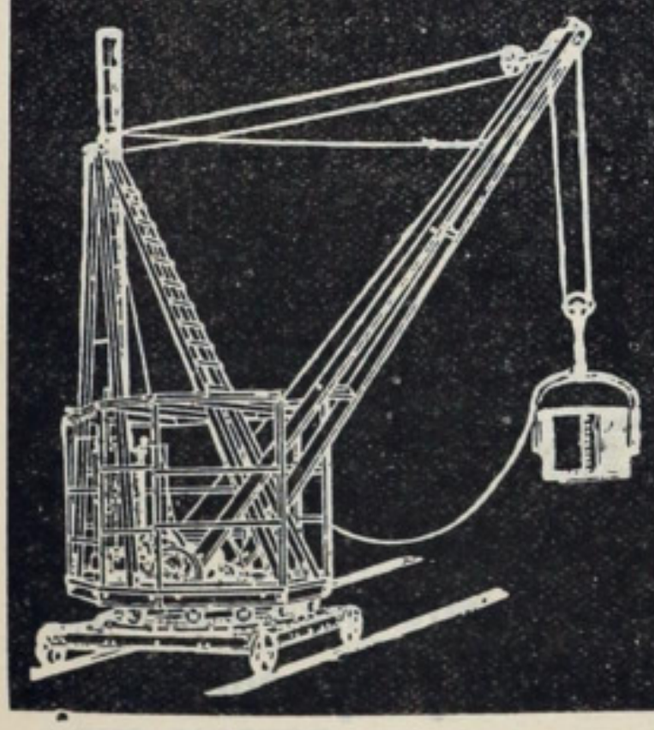

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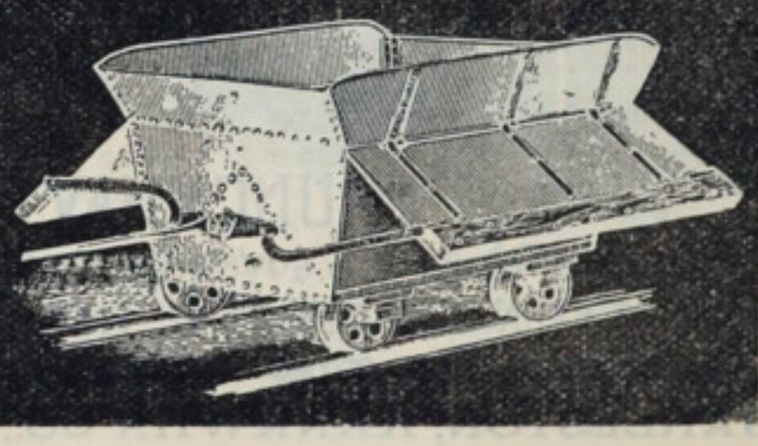

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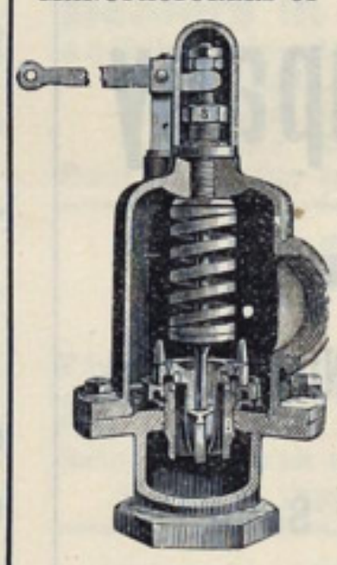

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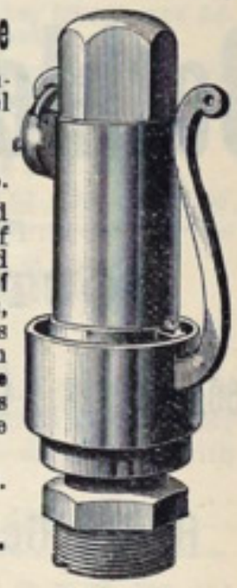

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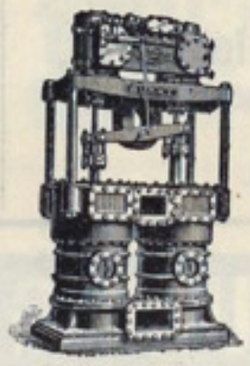

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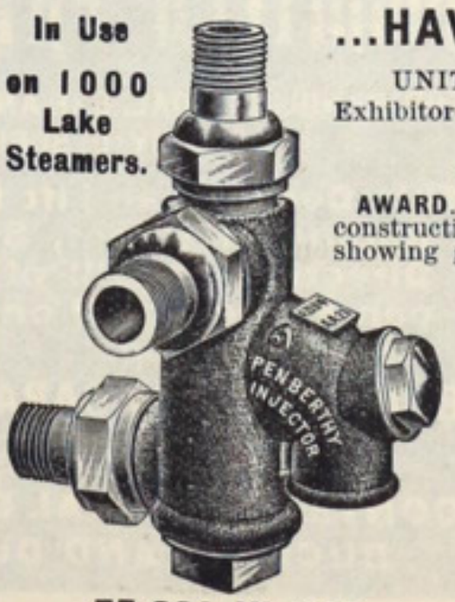


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(Signed) O. EMERSON SMITH, Individual Judge.
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